CLAIMS

1. A particle binding composition comprising the mixture products of:

water;

a carbohydrate;

a protein;

an iron compound;

a strong base; and

a pH adjustor included in an amount so that the composition has a pH in a range of about 9 to about 13.

2. A particle binding composition as defined in claim 1, said water having a concentration in a range of about 60% to about 99.9% by weight of the particle binding composition.

3. A particle binding composition as defined in claim 1, wherein said carbohydrate and said protein comprise at least one type of endosperm.

4. A particle binding composition as defined in claim 3, wherein said endosperm is derived or extracted from at least one type of cereal grain or legume.

5. A particle binding composition as defined in claim 4, wherein said endosperm is derived or extracted from at least one member selected from the group comprising wheat, rice, potatoes, corn, barley, sorghum, soy beans, and pinto beans.

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6. A particle binding composition as defined in claim 1, wherein said carbohydrate and protein of said endosperm are derived from a single source.

7. A particle binding composition as defined in claim 1, wherein said carbohydrate and protein of said endosperm are derived from different sources.

8. A particle binding composition as defined in claim 1, said endosperm having a concentration in a range of about 25% to about 95% by weight of solid components exclusive of said water.

9. A particle binding composition as defined in claim 1, said endosperm having a concentration in a range of about 50% to about 85% by weight of solid components exclusive of said water.

10. A particle binding composition as defined in claim 1, said endosperm having a concentration in a range of about 60% to about 75% by weight of solid components exclusive of said water.

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11. A particle binding composition as defined in claim 1, said iron compound comprising at least one type of iron oxide.

12. A particle binding composition as defined in claim 1, said iron compound comprising at least one of ferric oxide, ferrous oxide, iron halide or iron hydroxide.

13. A particle binding composition as defined in claim 1, said iron compound having a concentration in a range of about 0.01% to about 5% by weight of solid components exclusive of said water.

14. A particle binding composition as defined in claim 1, said iron compound having a concentration in a range of about 0.1% to about 1% by weight of solid components exclusive of said water.

15. A particle binding composition as defined in claim 1, said strong base comprising at least one member selected from the group comprising alkali metal oxides, alkaline earth metal oxides, alkali metal oxides, alkali metal hydroxides, and alkali metal carbonates.

16. A particle binding composition as defined in claim 1, said strong base having a concentration in a range of about 15% to about 50% by weight of solid components exclusive of said water.

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17. A particle binding composition as defined in claim 1, said strong base having a concentration in a range of about 25% to about 40% by weight of solid components exclusive of said water.

18. A particle binding composition as defined in claim 1, said pH adjustor comprising at least one weak acid.

19. A particle binding composition as defined in claim 18, said weak acid comprising at least one of citric acid, carbonic acid, formic acid, acetic acid, propanoic acid, benzoic acid, oxalic acid, glycolic acid, or ascorbic acid.

20. A particle binding composition as defined in claim 1, said pH adjustor comprising at least one strong acid.

21. A particle binding composition as defined in claim 20, said strong acid comprising at least one of sulfuric acid, sulfamic acid, hydrochloric acid, nitric acid, or phosphoric acid.

22. A particle binding composition as defined in claim 1, wherein said pH adjustor is included in an amount so that the composition has a pH in a range of about 10 to about 12.8.

23. A particle binding composition as defined in claim 1, wherein said pH adjustor is included in an amount so that the composition has a pH in a range of about 10.5 to about 12.6.

24. A particle binding composition as defined in claim 1, further comprising a fibrous material and seeds.

25. A particle binding composition as defined in claim 24, said fibrous material comprising a mixture of more highly processed fibers and coarser.

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26. A precursor composition for use in manufacturing a particle binding composition, comprising:

a carbohydrate;

a protein;

an iron compound;

a strong base; and

a pH adjustor included in an amount so as to form a particle binding composition having a pH in a range of about 9 to about 13 after the precursor composition is mixed with water.

27. A precursor composition as defined in claim 26, the precursor composition comprising at least two parts that are initially stored separately so that said two parts are individually mixable with water when manufacturing the particle binding composition.

28. A precursor composition as defined in claim 26, said carbohydrate and said protein comprising at least one type of endosperm.

29. A precursor composition as defined in claim 28, a mixture of at least a portion of said endosperm, iron compound and strong base comprising a first part of the precursor composition and the pH adjustor comprising a second part of the precursor composition.

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30. A precursor composition as defined in claim 26, said pH adjustor comprising a weak acid.

31. A precursor composition as defined in claim 30, said weak acid comprising at least one of citric acid, carbonic acid, formic acid, acetic acid, propanoic acid, benzoic acid, oxalic acid, glycolic acid, or ascorbic acid.

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32. A method of manufacturing a particle binding composition, comprising:

mixing together water, an endosperm comprising carbohydrate and protein, an iron compound, and a strong base to form an intermediate composition having a pH above 13; and

adding a pH adjustor to the intermediate composition to form the particle binding composition, the particle binding composition having a pH in a range of about 9 to about 13.

33. A method as defined in claim 32, said pH adjustor comprising a weak acid.

34. A method as defined in claim 32, further comprising adding a fibrous material and seeds to the intermediate composition or particle binding composition.

35. A method as defined in claim 34, said fibrous material comprising a mixture of more highly processed fibers and coarser fibers.

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36. A method of treating soil in order to bind particles found therein, comprising:

applying the particle binding composition of claim 1 to soil; and

allowing the particle binding composition to bind particles found within the soil.

37. A method of treating soil as defined in claim 36, the particle binding composition being applied by aerial spraying or broadcasting.

38. A method of treating soil as defined in claim 36, the particle binding composition being applied by mechanical ground-based spraying or broadcasting.

39. A method of treating soil as defined in claim 36, the particle binding composition being applied by manual spraying or broadcasting.

40. A method of treating soil as defined in claim 36, the particle binding composition being applied to soil at a construction site in order to prevent erosion.

41. A method of treating soil as defined in claim 36, the particle binding composition being applied to at least one of soil or ash at a burn site in order to prevent erosion.

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42. A method of treating soil as defined in claim 36, the particle binding composition being applied to denuded soil resulting from at least one of a land slide, an avalanche, grading of land.

43. A method of treating soil as defined in claim 36, the particle binding composition being applied to at least one of powders resulting from the grinding of rock or other industrial or building operations, particulates emitted by manufacturing processes, fly ash, cement, silica, or overburden and tailings from mining.

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